

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A drawing device for attenuating a plurality of filaments received from a spin pack of a meltspinning apparatus, said drawing device comprising:

a manifold including an inlet receiving the plurality of filaments from the spin pack, an outlet oriented in a cross-machine direction, and a passageway extending between said inlet and said outlet, said manifold having a slotted channel communicating with said passageway for discharging air in said passageway to impinge the filaments in said passageway, and said manifold discharging the filaments and the flow of air from said outlet in a downward direction perpendicular to said cross-machine direction;

a first plurality of guides positioned proximate to said outlet and aligned in a first row oriented in the cross-machine direction, each of said first plurality of guides inclined at a first angle relative to said downward direction, wherein each of said first plurality of guides has first and second side edges, a first surface extending between the first and second side edges parallel with the cross-machine direction, and second and third surfaces extending from the first and second side edges perpendicular to the cross-machine direction; and

a second plurality of guides positioned proximate to the outlet of the filament drawing

device and aligned in a second row oriented in the cross-machine direction, each of said second plurality of guides positioned between an adjacent pair of said first plurality of guides, and each of said second plurality of guides inclined at a second angle relative to said downward direction,
wherein each of said second plurality of guides has third and fourth side edges and a fourth surface extending between the third and fourth side edges parallel with the cross-machine direction, and the second and third surfaces of each of said first plurality of guides extend to the third and fourth edges of each of said second plurality of guides,

wherein said first plurality of guides and said second plurality of guides are configured to cause the flow of air and the filaments to deviate from said downward direction.

2. (Original) The drawing device of claim 1 further comprising:
a plurality of connecting surfaces each extending between one of said first plurality of guides and one of said second plurality of guides to eliminate open spaces therebetween.
3. (Original) The drawing device of claim 1 wherein said first angle is equal to said second angle.
4. (Original) The drawing device of claim 1 wherein said first angle is in the range of 3° to 30° .
5. (Original) The drawing device of claim 4 wherein said second angle is in the range of 3° to 30° .
6. (Previously Presented) The drawing device of claim 1 wherein said first plurality of guides and

said second plurality of guides are inclined symmetrically about a plane containing said downward direction so that said first angle is equal and opposite to said second angle.

7. (Previously Presented) The drawing device of claim 1 wherein said first plurality of guides and said second plurality of guides are configured to cause the flow of air and the filaments to deviate in opposite upstream and downstream directions relative to said downward direction.

8. (Previously Presented) A drawing device for attenuating a plurality of filaments received from a spin pack of a meltspinning apparatus, said drawing device comprising:

a manifold including an inlet receiving the plurality of filaments from the spin pack, an outlet oriented in a cross-machine direction, and a passageway extending between said inlet and said outlet, said manifold having a slotted channel communicating with said passageway for discharging air in said passageway to impinge the filaments in said passageway, and said manifold discharging the filaments and the flow of air from said outlet in a downward direction perpendicular to said cross-machine direction; and

a plurality of guides positioned proximate to said outlet and aligned in a row oriented generally in the cross-machine direction, said plurality of guides each inclined for causing the flow of air and the filaments to deviate from said downward direction, each of said plurality of guides having a plurality of facets inclined at different angles relative to said downward direction.

9. (Previously Presented) The drawing device of claim 8 wherein said different angles of said facets increase in inclination angle with increasing distance from said outlet.

10. (Previously Presented) A drawing device for attenuating a plurality of filaments received from a spin pack of a meltspinning apparatus, comprising:

at least one manifold including an inlet receiving the filaments from the spin pack, an outlet, and a slotted passageway extending between said inlet and said outlet, said at least one manifold adapted to apply a high-velocity flow of air in the slotted passageway to impinge the filaments, the filaments and the flow of air being discharged from said outlet in a discharge direction; and

a plurality of guides aligned in a row proximate to said outlet, said plurality of guides each inclined for causing the flow of air and the filaments to deviate from said discharge direction, said plurality of guides having an angle relative to said discharge direction that progressively varies across a width of said outlet.

11. (Previously Presented) The drawing device of claim 10 wherein said guides are inclined at equal angular increments between first and second angles about a plane containing the discharge direction.

12. (Currently Amended) A spunbonding apparatus for depositing filaments on a collector to form a nonwoven web, comprising:

a spin pack capable of forming filaments from a thermoplastic material;

a drawing device having an inlet receiving the plurality of filaments from the spin pack, an outlet oriented in a cross-machine direction, and a passageway extending between said inlet and said outlet, said manifold having a slotted channel communicating with said passageway for discharging air in said passageway to impinge the filaments in said passageway, and said manifold discharging the filaments and the flow of air from said outlet in a downward direction perpendicular to said cross-machine direction;

a first plurality of guides positioned proximate to said outlet and aligned in a first row oriented in the cross-machine direction, each of said first plurality of guides inclined at a first angle relative to said downward direction, wherein each of said first plurality of guides has first and second side edges, a first surface extending between the first and second side edges parallel with the cross-machine direction, and second and third surfaces extending from the first and second side edges perpendicular to the cross-machine direction; and

a second plurality of guides positioned proximate to the outlet of the filament drawing device and aligned in a second row oriented in the cross-machine direction, each of said second plurality of guides positioned between an adjacent pair of said first plurality of guides, and each of said second plurality of guides inclined at a second angle relative to said downward direction, wherein each of said second plurality of guides has third and fourth side edges and a fourth surface extending between the third and fourth side edges parallel with the cross-machine direction, and the second and third surfaces of each of said first plurality of guides extend to the third and fourth edges of each of said second plurality of guides,

wherein said first plurality of guides and said second plurality of guides cause the flow of air and the filaments to deviate from said downward direction, and said first angle of said first plurality of guides differs from said second angle of said second plurality of guides.

13. (Original) The spunbonding apparatus of claim 12 further comprising:

a plurality of connecting surfaces each extending between one of said first plurality of guides and one of said second plurality of guides to eliminate open spaces therebetween.

14. (Original) The spunbonding apparatus of claim 12 wherein said first angle is equal to said second angle.

15. (Original) The spunbonding apparatus of claim 12 wherein said first angle is in the range of 3° to 30°.

16. (Original) The spunbonding apparatus of claim 15 wherein said second angle is in the range of 3° to 30°.

17. (Previously Presented) The spunbonding apparatus of claim 12 wherein said first plurality of guides and said second plurality of guides are inclined symmetrically about a plane containing said downward direction so that said first angle is equal and opposite to said second angle.

18. (Original) The spunbonding apparatus of claim 12 wherein said first plurality of guides and said second plurality of guides are faceted.

19. (Previously Presented) The spunbonding apparatus of claim 12 wherein said first plurality of guides and said second plurality of guides are configured to cause the flow of air and the filaments to deviate in opposite upstream and downstream directions relative to said downward direction.

20. (Previously Presented) A spunbonding apparatus for depositing a plurality of filaments on a collector to form a nonwoven web, comprising:

a spin pack capable of forming filaments from a thermoplastic material;
a drawing device having an inlet receiving the plurality of filaments from said spin pack, an outlet oriented in a cross-machine direction, and a passageway extending between said inlet and said outlet, said filament drawing device having a slotted channel communicating with said passageway for discharging air in said passageway to impinge the filaments in said passageway, and said manifold discharging the filaments and air from said outlet in a downward direction perpendicular to said cross-machine direction; and

a plurality of guides positioned proximate to said outlet and aligned in a row oriented generally in the cross-machine direction, said plurality of guides each inclined for causing the flow of air and the filaments to deviate from said downward direction, each of said plurality of guides having a plurality of facets inclined at different angles relative to said downward direction.

21. (Previously Presented) The spunbonding apparatus of claim 20 wherein wherein said different angles of said facets increase in inclination angle with increasing distance from said outlet.

22. (Previously Presented) A spunbonding apparatus for depositing filaments on a collector to form a nonwoven web, comprising:

a spin pack capable of forming filaments from a thermoplastic material;
a drawing device including an inlet aligned for receiving the filaments from said spin pack, an outlet, and a slotted passageway extending from the inlet to the outlet, said filament drawing device adapted to apply a high-velocity flow of air in the slotted passageway between said inlet and said outlet to impinge the filaments, the filaments and air being discharged from said outlet in a discharge direction; and

a plurality of guides aligned in a row proximate to said outlet, said plurality of guides each inclined for causing the flow of air and the filaments to deviate from said discharge direction, and said plurality of guides having an angle relative to said discharge direction that progressively varies across a width of said outlet.

23. (Previously Presented) The spunbonding apparatus of claim 22 wherein said guides are inclined at equal angular increments between first and second angles about a plane containing the discharge direction.

24-29. (Canceled)

30. (Previously Presented) The drawing device of claim 1, wherein each guide of the first plurality of guides and of the second plurality of guides includes a surface that is parallel to the cross-machine direction.

31. (Previously Presented) The drawing device of claim 1, wherein said first angle differs from said second angle.

32. (Previously Presented) A drawing device for attenuating a plurality of filaments received from a spin pack of a meltspinning apparatus, said drawing device comprising:

a manifold including an inlet receiving the plurality of filaments from the spin pack, an outlet oriented in a cross-machine direction, and a passageway extending between said inlet and said outlet, said manifold having a slotted channel communicating with said passageway for discharging air in said passageway to impinge the filaments in said passageway, and said manifold discharging the filaments and the flow of air from said outlet in a downward direction perpendicular to said cross-machine direction; and

a plurality of guides positioned proximate to said outlet and aligned in a row oriented generally in the cross-machine direction, said plurality of guides each inclined for causing the flow of air and the filaments to deviate from said downward direction, each of said plurality of guides including a surface having an increasing angle of inclination relative to said downward direction with increasing distance from said outlet.

33. (New) A drawing device for attenuating a plurality of filaments received from a spin pack of a meltspinning apparatus, said drawing device comprising:

a manifold including an inlet receiving the plurality of filaments from the spin pack, an outlet oriented in a cross-machine direction, and a passageway extending between said inlet and said outlet, said manifold having a slotted channel communicating with said passageway for discharging air in said passageway to impinge the filaments in said passageway, and said manifold discharging the filaments and the flow of air from said outlet in a downward direction perpendicular to said cross-machine direction;

a first plurality of guides positioned proximate to said outlet and aligned in a first row oriented in the cross-machine direction, each of said first plurality of guides inclined at a first angle relative to said downward direction; and

a second plurality of guides positioned proximate to the outlet of the filament drawing device and aligned in a second row oriented in the cross-machine direction, each of said second plurality of guides positioned between an adjacent pair of said first plurality of guides, and each of said second plurality of guides inclined at a second angle relative to said downward direction,

wherein said first plurality of guides and said second plurality of guides are inclined relative to a plane containing said downward direction so that said first angle is a positive declination angle relative to said plane along the downward direction and said second angle is negative declination angle relative to said plane along the downward direction, such that said first angle is opposite said second angle relative to the plane,

wherein said first plurality of guides and said second plurality of guides are configured to cause the flow of air and the filaments to deviate from said downward direction.

34. (New) The drawing device of claim 33 further comprising a plurality of connecting surfaces each extending between one of said first plurality of guides and one of said second plurality of guides to eliminate open spaces therebetween.

35. (New) The drawing device of claim 33 wherein said first angle is equal to said second angle.

36. (New) A spunbonding apparatus for depositing filaments on a collector to form a nonwoven web, comprising:

a spin pack capable of forming filaments from a thermoplastic material;
a drawing device having an inlet receiving the plurality of filaments from the spin pack, an outlet oriented in a cross-machine direction, and a passageway extending between said inlet and said outlet, said manifold having a slotted channel communicating with said passageway for discharging air in said passageway to impinge the filaments in said passageway, and said manifold discharging the filaments and the flow of air from said outlet in a downward direction perpendicular to said cross-machine direction;

a first plurality of guides positioned proximate to said outlet and aligned in a first row oriented in the cross-machine direction, each of said first plurality of guides inclined at a first angle relative to said downward direction; and

a second plurality of guides positioned proximate to the outlet of the filament drawing device and aligned in a second row oriented in the cross-machine direction, each of said second plurality of guides positioned between an adjacent pair of said first plurality of guides, and each of said second plurality of guides inclined at a second angle relative to said downward direction,

wherein said first angle of said first plurality of guides differs from said second angle of said second plurality of guides,

wherein said first plurality of guides and said second plurality of guides are inclined relative to a plane containing said downward direction so that said first angle is a positive declination angle relative to said plane along the downward direction and said second angle is negative declination angle relative to said plane along the downward direction, such that said first angle is opposite said second angle relative to the plane, and

wherein said first plurality of guides and said second plurality of guides cause the flow of air and the filaments to deviate from said downward direction.

37. (New) The spnbonding apparatus of claim 36 further comprising a plurality of connecting surfaces each extending between one of said first plurality of guides and one of said second plurality of guides to eliminate open spaces therebetween.